

Lampsilis ventricosa canadensis (Lea), Shells everywhere; living—East Harbor.

Truncilla donaciformis (Lea), Living—East Harbor, off Rattlesnake Island.

Dysnomia perplexa possibly variety *rangiana* (Lea), Shells everywhere, but not common.

Dysnomia triquetra (Rafinesque), Shells common.

THE STATUS OF PAPHIA TENERRIMA ALTA WATERFALL

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In a study of the paleontology of the Fernando Group of California L. N. Waterfall (Univ. Calif. Pub., Bull. Dept. Geol. Sci., Vol. 18, No. 3, 1929, p. 85, pl. 6, fig. 1) described *Paphia tenerrima* subspecies *alta* from the "Saugus" Pleistocene. He said (*loc. cit.*) of the supposed subspecies: "This subspecies is very similar to *Paphia tenerrima* Carpenter, but is readily distinguished by its relatively greater height and more strongly vertical truncated posterior end." And also: "Similar types of variations to this are noted in the living *P. tenerrima*, so that the writer has no hesitation in placing the two specimens collected in the same subspecies"—in spite of which he listed (*op. cit.*, checklist opposite p. 78) the "subspecies" as extinct.

During an examination of a fauna from the Pleistocene of the Puget Sound region a specimen was found which proved to be indistinguishable from *P. t. alta*. A study of the validity of this name was made resulting in the following conclusions.

First, the variety "*alta*" is simply an unusually high specimen of *P. tenerrima* Carpenter which falls within the distribution curve of that species as a perfectly normal end member. As it is coexistent, both geographically and temporally, with the typical form it cannot be regarded as more than a variety, and does not, in my estimation, merit even a varietal name.

Second, this variety, if accepted, must be considered as a living form, and cannot be of any great stratigraphic value. A specimen from Puget Sound (No. 1366 in the collection of the University of Washington Museum) has both the relative height and vertically truncated posterior which serve to distinguish the variety *alta*.

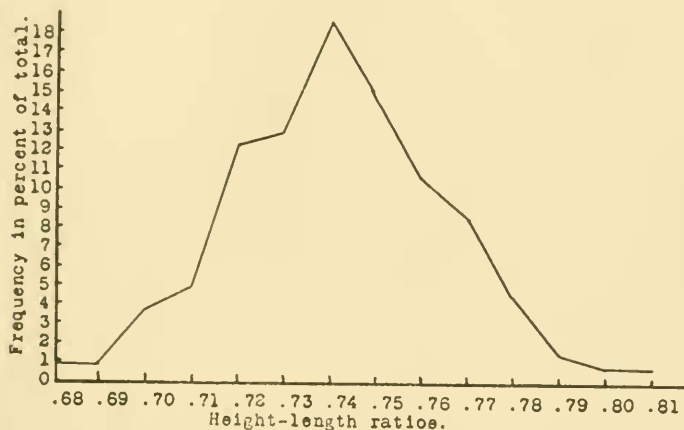


Fig. 1. Height-length ratios of a series of 239 specimens of *Paphia tenerrima* Carpenter from the Pleistocene of Port Blakely, Washington.

As evidence of the relation of the type of *alta* to a series of typical specimens the accompanying graph is submitted. Height-length ratios are plotted against frequency in percent of the total number of specimens. 239 specimens collected indiscriminately from the Upper Pleistocene at Port Blakely, Washington, were measured. In this graph it will be seen that greater numbers indicate relatively higher shells. The type of *alta*, from the dimensions in the original description, has a ratio of .82. While this is very slightly higher than any of the shells in the measured series it fits perfectly at the extreme upper end of the distribution curve. Although variation in outline, such as might not be shown by the dimensions, does not lend itself well to graphical expression it was observed to have a corresponding distribution and would doubtless fit the same sort of curve.

If the varietal name *alta* is accepted the only consistent course will be to recognize and name the equally distinctive low form at the opposite end of the curve—an encumbering of the literature to which I am sure any conscientious worker would object.

VARIATION IN THE SCULPTURE OF *ACILA CASTRENSIS* HINDS

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The fossil species of *Acila* are, because of the similarity of the various species, as well as because of their individual variability, more or less of a problem to the paleontologist. Dall¹ considered that, ordinarily, only one species occurs in a geologic horizon. If this were the case there would be difficulty enough in differentiating between species. Subsequent workers have, however, often listed several species from beds of a single age, only one of which might be important as a marker. It is obviously important, then, that the range of variation be known, so that a single valid species of stratigraphic importance might not be split into several of doubtful worth. It is hoped that this study may help to show the limits of variation, in the sculpture at least, of this genus.

Work on this species was suggested by Dr. H. G. Schenck of Stanford University, who is preparing a comprehensive study of the fossil and recent species of *Acila*, and to whom I am indebted for many helpful suggestions. I am also under obligation to Professor Kincaid of the University of Washington for suggestions and constructive criticism during the course of the work.

Material in the form of some three hundred and fifty-eight specimens of *Acila castrensis* was obtained from the Marine Biological Station of the University of Washington, located at Friday Harbor, Washington. As no record was kept of

¹ U. S. Geol. Sur., Prof. Paper 59, 1909, p. 102.